WHAT IS CLAIMED IS

1. A wavelength multiplexing method wherein a plurality of optical signals, each being assigned a unique wavelength, are input to and output from a plurality of variable optical attenuators, respectively, wavelength-multiplexed by a multiplexer, and output from said multiplexer; said wavelength-multiplexed output is spectrum-analyzed by an optical monitor unit, and a spectrum-analyzed level of each of said optical signals is measured; and an input level of each of said optical signals input from said respective variable optical attenuator to said multiplexer is adjusted by said respective variable optical attenuator such that the spectrum-analyzed levels of all said optical signals become the same, the method comprising the steps of:

detecting said input level of each of said optical signals from said respective variable optical attenuator to said multiplexer, and

controlling an attenuation amount of each of said variable optical attenuators based on a difference between said input level of said respective optical signal from said variable optical attenuator to said multiplexer and said spectrum-analyzed level measured by said optical monitor unit.

2. A wavelength multiplexing apparatus wherein a plurality of optical signals, each being assigned a unique wavelength, are input to and

output from a plurality of variable optical attenuators, respectively, wavelength-multiplexed by a multiplexer, and output from said multiplexer; said wavelength-multiplexed output is spectrum-analyzed by an optical monitor unit, and a spectrum-analyzed level of each of said optical signals is measured; and an input level of each of said optical signals input from said respective variable optical attenuator to said multiplexer is adjusted by said respective variable optical attenuator such that the spectrum-analyzed levels of all said optical signals become the same, comprising:

input optical level detecting means for detecting said input level of each of said optical signals from said respective variable optical attenuator to said multiplexer, and

attenuation amount controlling means for controlling an attenuation amount of each of said variable optical attenuators based on a difference between said input level of said respective optical signal from said variable optical attenuator to said multiplexer and said spectrum-analyzed level measured by said optical monitor unit.

3. The wavelength multiplexing apparatus as claimed in claim 2, further comprising:

alarm detecting means for detecting an alarm when said input level detected by said input optical level detecting means is determined to be lower than a predetermined threshold level, and

threshold level controlling means for adjusting said threshold level of said alarm detecting means based on whether each of said optical signals is input from a stable optical

source.

4. The wavelength multiplexing apparatus as claimed in claim 2, wherein each of said variable optical attenuators is configured by two or more variable optical attenuators that are cascaded.

5. The wavelength multiplexing apparatus as claimed in claim 2, wherein said attenuation amount controlling means control the attenuation amount of each of said variable optical attenuators such that a prevailing attenuation amount is changed by an amount that is smaller than a difference between said spectrum-analyzed level and said input level from said variable optical attenuator.

6. The wavelength multiplexing apparatus as claimed in claim 5, wherein said attenuation amount controlling means change said attenuation amount of each of said variable optical attenuators in steps based on the difference between the spectrum-analyzed level and the input level from the variable optical attenuator.

7. The wavelength multiplexing apparatus

as claimed in claim 5, wherein said attenuation amount controlling means set up a maximum amount of change of the attenuation amount of the variable optical attenuator where the difference between the spectrum-analyzed level and the input level from the variable optical attenuator is greater than a predetermined value.

8. The wavelength multiplexing apparatus as claimed in claim 5, wherein said attenuation amount controlling means change the attenuation amount according to a curve, a tangent of the curve being gradually decreased with respect to an increase of the difference between the spectrum-analyzed level and the input level from the variable optical attenuator.

9. The wavelength multiplexing apparatus as claimed in claim 2, wherein said attenuation amount controlling means suspend controlling of the attenuation amount of the variable optical attenuator when level change of the input optical signal exceeds a dynamic range of the variable optical attenuator.

10. The wavelength multiplexing apparatus as claimed in claim 3, wherein said threshold level controlling means adjust said threshold level of

said alarm detecting means based on information relative to an amplified spontaneous emission power level, the information being provided by an upstream wavelength multiplexing apparatus.

11. The wavelength multiplexing apparatus as claimed in claim 3, further comprising input level calculating means for calculating the input level to each of said variable optical attenuators based on the output level of said respective variable optical attenuator of the optical signal detected by said optical level detecting means, wherein said alarm detecting means perform alarm detection when the input level calculated by said input level calculating means is less than said threshold value.